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(54) Making patterns on concrete

(57) The tool shown (Figure 2) when pressed into a fresh concrete surface leaves behind brick impressions. The tool has a base 22, a textured surface 23 and blades 21. Other similar tools make stone, tile or other impressions in concrete.

Fig. 2.

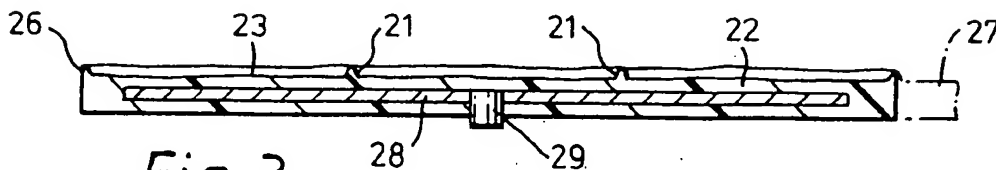
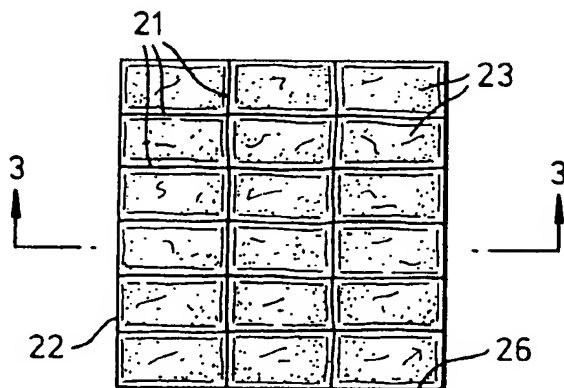
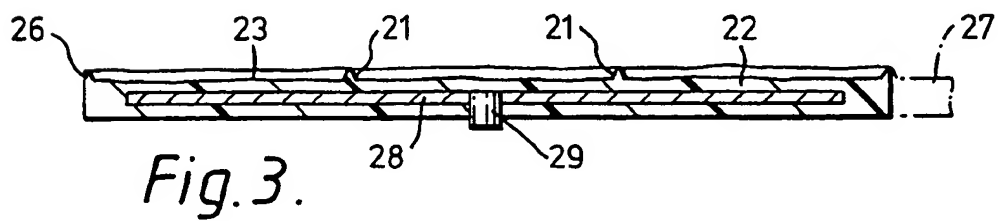
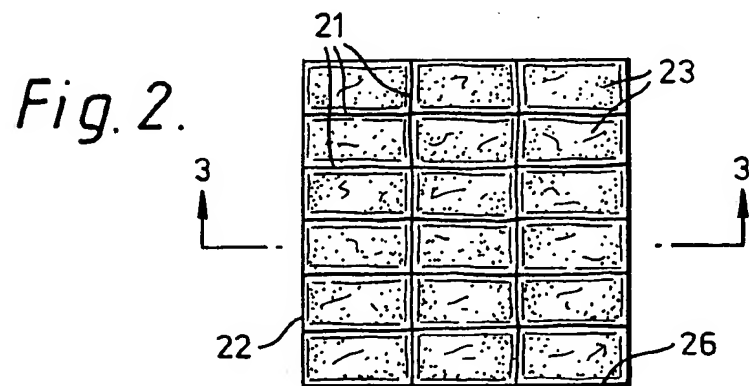
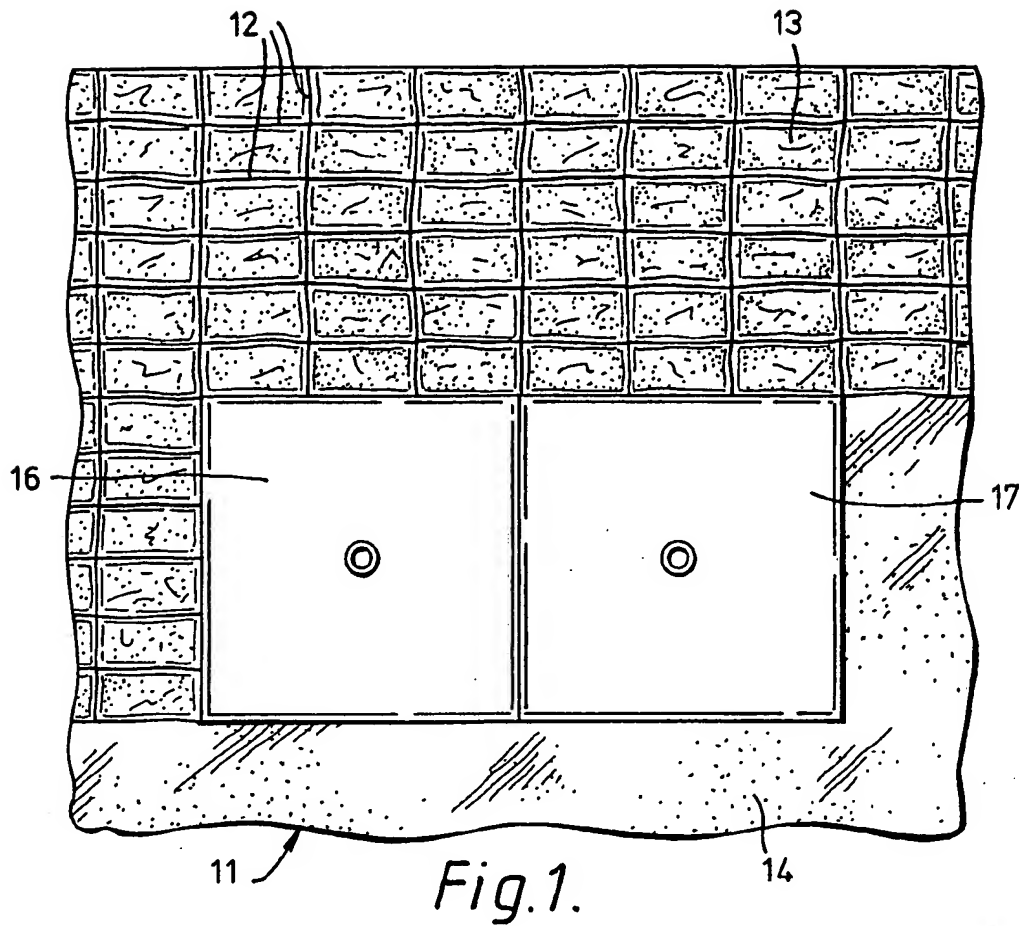


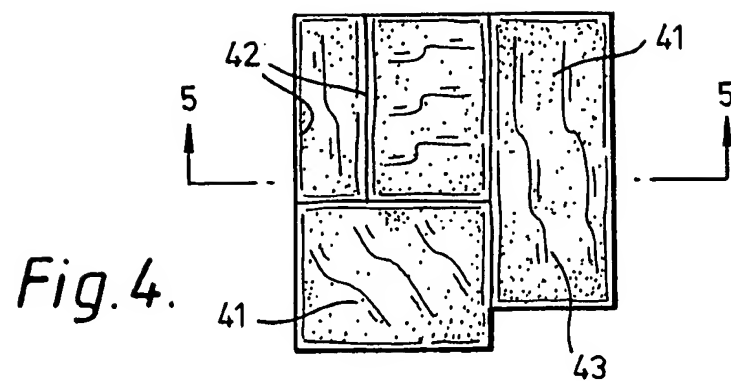
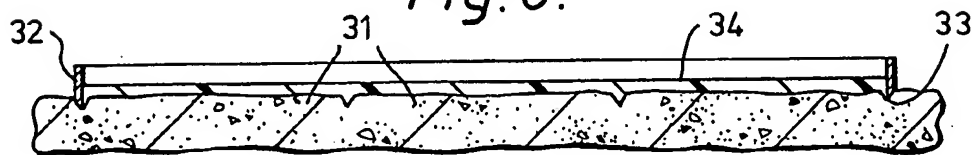
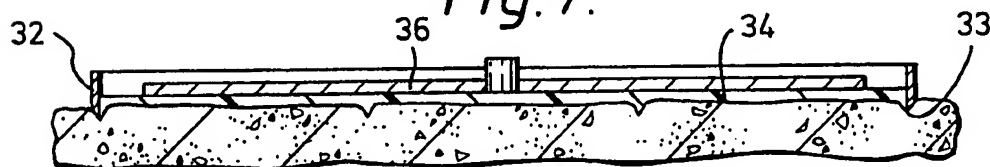
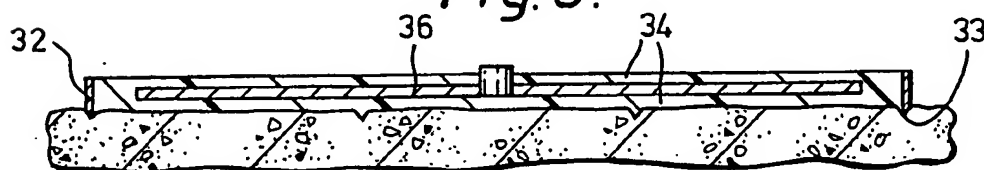
Fig. 3.

GB 2 111 897 A

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2/2

*Fig. 5.**Fig. 6.**Fig. 7.**Fig. 8.*

SPECIFICATION

Imprinting patterns and surface textures in fresh concrete

5 This invention relates to the imprinting of patterns and surface textures in fresh concrete and more particularly to an imprinting tool and a method of making such a tool for imprinting selected patterns or the like and surface textures in fresh concrete.

10 The imprinting of patterns in concrete surfaces is well known in the prior art. U.S. Patent 519,919 (Maurer) discloses a tool which includes projections or blades defining a pattern. The tool is applied to the smooth unbroken surface of a pavement while it is still in the plastic state to form a plurality of patterned indentations defining a tile design. U.S. Patent 3,406,618 (Bowman), U.S. Patent 4,131,406 (Fresquez) and U.S. Patent 4,135,840 (Puccini) disclose tools which comprise open patterns of blades adapted to co-operate with the smooth upper surface of concrete or pavement to form indentations corresponding to a tile, stone, brick or other pattern. The patterns may be repeating patterns such as bricks, tiles and the like, or non-repeating patterns such as slate, cobblestone, stone, etc. The prior art tools include tools in which the stones or bricks are all defined within the tool, and tools in which the exterior stone or bricks of a pattern repeat are only partly defined, the remainder of such exterior bricks or stones being defined with an adjacent tool or imprint.

In all of the prior art tools and methods, the texture of the upper surface of each stone, tile, brick or the like of the pattern is defined by the troweled upper surface formed prior to the imprinting step. However, the surfaces of natural stones, used bricks, slate and the like have a distinctive surface texture. It is therefore desirable not only to provide a tool which provides grooves defining the periphery of the artificial bricks, stones, etc. but one which also provides natural looking or aesthetically pleasing surface textures.

It is a general object of the present invention to provide an improved imprinting tool which imprints grooves outlining selected patterns and also textures the surface, and to provide an improved method of making the tool.

Thus in one aspect the invention provides a tool having blades for making impressions including grooves in fresh concrete, characterised by a base having a textured surface for engaging and texturing the surface of the concrete and a plurality of integral blades extending outwardly from the textured base surface, for imprinting grooves in the concrete.

Preferably the base and blades are formed integrally by casting, desirably in a castable elastomer such as polyurethane. Such a tool may include means for stiffening the base, for instance a stiffening member cast into the elastomer.

In preferred embodiments, the tool includes a base having a textured lower surface for engaging the surface of the concrete and texturing the concrete surface, a plurality of internal V-shaped blades integral with the base and extending outwardly from

the said lower surface, and edge blades at the peripheral edges of said tool, said edge blades having a configuration corresponding with one half of that of an internal blade so as to co-operate with an adjacent tool to form a V-shaped blade, said blades in use of the tool forming V-shaped grooves in the concrete and said lower surface texturing the surface of the concrete.

The invention also provides a method of making a tool for creating impressions in fresh concrete, characterised by the steps of forming a master mould of the desired surface configuration, placing a dam having the dimensions of the tool on the surface of the master mould, pouring a castable elastomer in said dam to cover the surface, allowing the elastomer to set up, and removing the tool from the mould.

The mater mould preferably includes grooves and the dam is arranged to extend into those grooves.

A rigid support may be embedded in the elastomer, to stiffen the tool formed by the method.

Preferred embodiments of the invention are illustrated in the accompanying drawings, wherein:

Figure 1 shows a simulated brick pavement and associated imprinting tools;

Figure 2 is a bottom view of an imprinting tool used in patterning and texturing concrete to form the pavement shown in *Figure 1*;

Figure 3 is an enlarged sectional view taken along line 3-3 of *Figure 2*;

Figure 4 shows a tool suitable for forming a simulated slate pavement;

Figure 5 is an enlarged sectional view taken along the line 5-5 of *Figure 4*; and

Figures 6, 7 and 8 show the steps in one method of constructing a tool in accordance with the present invention.

Figure 1 shows a section of pavement 11 which is being patterned with an imprinting tool in accordance with the present invention in a simulated brick pattern. The bricks of the pattern are defined by grooves 12 formed by blades of the tool and the upper surfaces 13 of the simulated bricks are textured by the bottom of the tool. The portion of pavement shown at 14 has been troweled but not imprinted, grooved and textured. After the formation of the grooves 12 which define the bricks, grout or the like may be applied in the grooves if desired or the grooves may be left open. In the example shown, the pattern is being formed by tools 16 and 17 placed adjacent to each other and on the surface of the fresh troweled concrete. Prior to the application of the tool a suitable releasing compound, which may contain colour, is applied to the surface of the fresh concrete so that the tools do not adhere to the surface and can be lifted after the imprinting step without damaging the grooves and surface. One tool can be moved and placed adjacent to another tool to form a continuation of the imprinted surface. As explained above, the tools are formed with ribs or blades extending outwardly from a textured bottom surface. When the tool is applied, the blades form the grooves 12 and the textured bottom of the tool textures the upper surface of the pavement thereby to form a simulated brick, stone or the like surface.

A tool in accordance with the present invention having a brick-forming pattern is illustrated in Figures 2 and 3. The tool includes a plurality of blades 21 formed integral with a base 22 which has a textured surface 23. The typical depth of the blades is between one-quarter and three-eighths of an inch (6 to 9.5mm). Preferably the blades are tapered so that they can be easily inserted into the concrete and so that when they are withdrawn they quickly release from the concrete. The edge blades 26 include one-half of the tapered configuration of the internal blades 21, so that when another tool is placed adjacent to the first, the juxtaposed edge blades co-operate to define a complete tapered blade, as illustrated at 27 on the right hand side of Figure 3. The respective blades 26 join at the cutting edge of the juxtaposed blades, a feature that substantially reduces or eliminates any flow of concrete up between the edge blades of adjacent tools and which would form an unattractive appearance at that point.

The blades 21 and surface 22 may be formed with a castable elastomer such as polyurethane. In accordance with one feature of the present invention the tool preferably includes a rigid core 28 which is moulded in the tool to provide stiffening. A handle-receiving fixture 29 is suitably secured to the tool and extends outwardly from the back of the tool whereby a handle can be threaded or otherwise secured to the tool.

The tool shown in Figures 4 and 5 is suitable for making a simulated slate surface. The individual slates 41 of the pattern are of different size and defined by the blades 42; the bottoms which provide the surface texture are textured as shown at 43. The tool has a notch that provides for offsetting adjacently placed tools so that there are no long straight lines. Tools imprinting different sized stones may be employed to enhance the appearance of randomness.

Figures 6, 7 and 8 illustrate the method of fabricating a tool in accordance with the present invention. The method is started by forming a surface with a master pattern or by selecting a pavement with the pattern which is to be simulated, such as the pattern of bricks 31. A dam 32 is defined by a rectangular, square or other shaped structure which rests upon the surface of the pavement or surface to be replicated and extends into grooves 33 in that surface. A layer 34 of castable elastomer such as polyurethane is then applied to the upper surface as shown in Figure 6 and is retained by the dam 32. A suitable stiffening member 36 such as a wooden board is applied to the surface of the layer 34 as shown in Figure 7 to form the core of the tool. This core of the tool may be formed of materials other than wood, such as plastics, expanded foam for lightness, metal or other suitable filler. Thereafter additional elastomer such as polyurethane is applied to embed the stiffening member 36. The polyurethane is then allowed to cure and the completed tool is removed. In this manner the blades and textured surface are formed to be negatives to that of an actual existing pavement or master surface and will provide for replication of the

surface. It is apparent that any type of pattern such as brick, stone, slate or any other desired pattern can be formed in the master and replicated by the process just described. Thus, there is formed a light weight imprinting tool which permits easy application and removal of the tool by a worker. The stiffening member keeps the tool planar in use and yet provides an elastomeric imprinting face.

The installation of a patterned concrete surface is generally accomplished by first pouring a concrete mix into forms and screeding to the proper grade. The poured mix is then floated to a uniform surface in the normal manner. A colour hardener may optionally then be applied to the surface: such a hardener is a special mixture of cement, colour, aggregate and dispersing agents. A suitable colour hardener may be purchased from Bomanite Corporation, Palo Alto, California or elsewhere. The hardener may be applied in two or more steps with floating between applications and a final troweling. A specially formulated release agent is applied to the troweled surface to prevent the moist concrete from sticking to the tool. Alternatively or additionally, release agent may also be applied to the surfaces of the tool which will contact the concrete. A suitable release agent is Bomanite Release Agent that may be purchased from Bomanite Corporation. While the concrete is still in the plastic stage of set, the imprinting tool is applied to the surface and vibrated or pounded to imbed its blades and form the upper surface texture. The tool is then lifted up and moved to and applied at another location. After the concrete has achieved sufficient strength to bear light traffic without wear, any residual release agent may be removed from the surface. If desired the surface can be sealed and burnished with a suitable sealing material or coating, for example Bomanite Color Curing Compound, obtainable from Bomanite Corporation.

If desired, the tools may be fabricated as described but without a stiffening member 36, so that the tools are flexible. Suitable handles such as rope handles may be cast in the elastomer. Such flexible tools may be used to pattern and texture small areas of concrete not accessible with the preferred stiffened tool. Such small areas may exist because of obstructions such as walls, columns, trees or the like which would interfere with the use of the stiff tool. When such situations occur, the workman then places a flexible tool, often by bending it so that only part of it is in contact with the concrete surface to be imprinted and the other part of it is curved up and away from the concrete surface and perhaps in contact with a vertical surface of the obstruction. The part of the flexible tool in contact with the concrete surface is then impressed into the concrete, by hand or by careful use of a suitable tamping tool.

While only two particular designs of imprinting tool have been presented it will be understood by those skilled in the art that a tool having any desired design may be formed by beginning with a surface to be replicated and then moulding the tool using that surface as the master mould.

CLAIMS

1. A tool having blades for making impressions including grooves in fresh concrete, characterised by
5 a base having a textured surface for engaging and texturing the surface of the concrete and a plurality of integral blades extending outwardly from the textured base surface, for imprinting grooves in the concrete.
- 10 2. A tool according to claim 1, wherein said base and blades are formed integrally by casting.
3. A tool according to claim 2, wherein said base and blades are formed of a castable elastomer.
4. A tool according to claim 3, wherein said
15 elastomer is polyurethane.
5. A tool according to claim 3 or 4, including means for stiffening the base.
6. A tool according to claim 5, wherein said stiffening means is cast into the elastomer.
- 20 7. A tool according to any one of the preceding claims, including a base having a textured lower surface for engaging the surface of the concrete and texturing the concrete surface, a plurality of internal V-shaped blades integral with the base and extend-
25 ing outwardly from the said lower surface, and edge blades at the peripheral edges of said tool, said edge blades having a configuration corresponding with one half of that of an internal blade so as to co-operate with an adjacent tool to form a V-shaped
30 blade, said blades in use of the tool forming V-shaped grooves in the concrete and said lower surface texturing the surface of the concrete.
8. A tool for imprinting concrete substantially as described with reference to and as shown in Figures
35 2 and 3 or Figures 4 and 5 of the accompanying drawings.
9. A method of making a tool for creating impressions in fresh concrete, characterised by the steps of forming a master mould of the desired
40 surface configuration, placing a dam having the dimensions of the tool on the surface of the master mould, pouring a castable elastomer in said dam to cover the surface, allowing the elastomer to set up, and removing the tool from the mould.
- 45 10. A method according to claim 9, wherein the master mould includes grooves and the dam extends to the bottom of said grooves.
11. A method according to claim 9 or 10, including the step of embedding a rigid support in said
50 elastomer.
12. A method of making an imprinting tool, substantially as described with reference to Figures 6 to 8 of the accompanying drawings.
13. Every novel feature and every novel com-
55 bination of features herein disclosed.